

UTILITY PATENT APPLICATION TRANSMITTAL (Small Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.
NRI-2001

Total Pages in this Submission
56

TO THE ASSISTANT COMMISSIONER FOR PATENTS

Box Patent Application
Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

METHOD AND APPARATUS FOR MEASURING USER ACCESS TO IMAGE DATA

and invented by:

SIMON S. CHEN
YEN WHEI CHOW
TODD TAO ZHOU

If a CONTINUATION APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

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Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 31 pages and including the following:
 - a. ☒ Descriptive Title of the Invention
 - b. ☐ Cross References to Related Applications (if applicable)
 - c. ☐ Statement Regarding Federally-sponsored Research/Development (if applicable)
 - d. ☐ Reference to Microfiche Appendix (if applicable)
 - e. ☒ Background of the Invention
 - f. ☒ Brief Summary of the Invention
 - g. ☒ Brief Description of the Drawings (if drawings filed)
 - h. ☒ Detailed Description
 - i. ☒ Claim(s) as Classified Below
 - j. ☒ Abstract of the Disclosure

UTILITY PATENT APPLICATION TRANSMITTAL (Small Entity)

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Application Elements (Continued)

3. ☒ Drawing(s) (when necessary as prescribed by 35 USC 113)
- a. ☒ Formal b. ☐ Informal Number of Sheets 10
4. ☒ Oath or Declaration
- a. ☒ Newly executed (original or copy) ☐ Unexecuted
- b. ☐ Copy from a prior application (37 CFR 1.63(d)) (for continuation/divisional application only)
- c. ☒ With Power of Attorney ☐ Without Power of Attorney
- d. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s) named in the prior application,
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference (usable if Box 4b is checked)
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
6. ☐ Computer Program in Microfiche
7. ☐ Genetic Sequence Submission (if applicable, all must be included)
- a. ☐ Paper Copy
- b. ☐ Computer Readable Copy
- c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

Accompanying Application Parts

8. ☒ Assignment Papers (cover sheet & documents)
9. ☒ 37 CFR 3.73(b) Statement (when there is an assignee)
10. ☐ English Translation Document (if applicable)
11. ☐ Information Disclosure Statement/PTO-1449 ☐ Copies of IDS Citations
12. ☐ Preliminary Amendment
13. ☒ Acknowledgment postcard
14. ☐ Certificate of Mailing
- ☐ First Class ☐ Express Mail (Specify Label No.): _____

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Accompanying Application Parts (Continued)

15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)
16. ☒ Small Entity Statement(s) - Specify Number of Statements Submitted: 2
17. ☐ Additional Enclosures (please identify below):

Fee Calculation and Transmittal


CLAIMS AS FILED

For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	16	- 20 =	0	x \$9.00	\$0.00
Indep. Claims	4	- 3 =	1	x \$39.00	\$39.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
BASIC FEE					\$380.00
OTHER FEE (specify purpose)					\$0.00
TOTAL FILING FEE					\$419.00

- ☒ A check in the amount of _____ to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. **50-0578** as described below. A duplicate copy of this sheet is enclosed.
- ☐ Charge the amount of _____ as filing fee.
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- ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
- ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

Dated:

3/12/99


Signature

cc:

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) AND 1.27 (c)) - SMALL BUSINESS CONCERN

Docket No.
NRI-2001

Serial No.

Filing Date

Patent No.

Issue Date

Applicant/

Patentee: **NET RATINGS, INC.; DAVE TOTH President.**

Invention:

METHOD AND APPARATUS FOR MEASURING USER ACCESS TO IMAGE DATA

I hereby declare that I am:

- ☐ the owner of the small business concern identified below:
☒ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN: NET RATINGS, INC.ADDRESS OF CONCERN: 830 HILLVIEW CT. SUITE 138, MILPITAS, CA 95035

I hereby declare that the above-identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the above identified invention described in:

- ☒ the specification filed herewith with title as listed above.
☐ the application identified above.
☐ the patent identified above.

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed on the next page and no rights to the invention are held by any person, other than the inventor, who could not qualify as an independent inventor under 37 CFR 1.9(c) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☐ no such person, concern or organization exists.
☐ each such person, concern or organization is listed below.

FULL NAME

ADDRESS

☐

Individual

☐

Small Business Concern

☐

Nonprofit Organization

FULL NAME

ADDRESS

☐

Individual

☐

Small Business Concern

☐

Nonprofit Organization

FULL NAME

ADDRESS

☐

Individual

☐

Small Business Concern

☐

Nonprofit Organization

FULL NAME

ADDRESS

☐

Individual

☐

Small Business Concern

☐

Nonprofit Organization

Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING:

DAVE TOTH

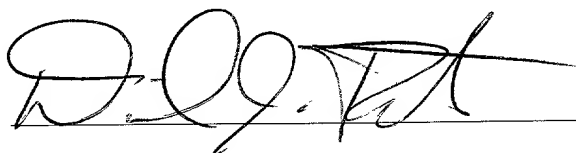
TITLE OF PERSON SIGNING

OTHER THAN OWNER:

President

ADDRESS OF PERSON SIGNING:

SIGNATURE:



DATE:

3/10/99

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f) AND 1.27 (b)) - INDEPENDENT INVENTOR**

Docket No.
NRI-2001

Serial No.

Filing Date

Patent No.

Issue Date

Applicant/

Patentee: **SIMON S. CHEN; YEN WHEI CHOW; TODD TAO ZHOU**

Invention:

METHOD AND APPARATUS FOR MEASURING USER ACCESS TO IMAGE DATA

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled above and described in:

- ☒ the specification to be filed herewith.
☐ the application identified above.
☐ the patent identified above.

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☐ No such person, concern or organization exists.
☒ Each such person, concern or organization is listed below.

*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities (37 CFR 1.27)

FULL NAME **NET RATINGS, INC; DAVE TOTH President.**

ADDRESS **830 HILLVIEW CT., SUITE 138, MILPITAS, CA 95035**
☐ Individual ☒ Small Business Concern ☐ Nonprofit Organization

FULL NAME

ADDRESS

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

FULL NAME

ADDRESS

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

FULL NAME

ADDRESS

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF INVENTOR SIMON S. CHEN

SIGNATURE OF INVENTOR 

DATE: 3/10/99

NAME OF INVENTOR YEN WHEI CHOW

SIGNATURE OF INVENTOR 

DATE: 3/10/99

NAME OF INVENTOR TODD TAO ZHOU

SIGNATURE OF INVENTOR 

DATE: 3/10/99

NAME OF INVENTOR _____

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NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

DATE: _____

UNITED STATES PATENT APPLICATION

FOR

METHOD AND APPARATUS FOR MEASURING
USER ACCESS TO IMAGE DATA

Inventors: Simon S. Chen
Yen Whei Chow
Todd Tao Zhou

Patent Application No. 12/123,456

BACKGROUND OF THE INVENTION

1.
FIELD OF THE INVENTION

The present invention relates to the field of network analysis in general, and in particular, to HTTP based network analysis.

2.
DESCRIPTION OF THE RELATED ART

Many, if not most of Internet based businesses depend on advertising for revenue generation. One common method of generating revenue is to charge for displaying the advertisements or banner images of third parties. In some cases, instead of charging fees, or as partial consideration for displaying such ad banner images, an exchange program is arranged whereby two entities agree to display each other's banner images on their respective Internet sites. As with any form of advertising, it is important to know how many persons are viewing the particular advertisements or banner images, and what percentage of viewers respond to advertisements by clicking on the ads or by responding to the ads in some measurable manner.

In the sense that revenue is often advertising based, Internet-based business opportunities can be equated to the television industry. In the television industry, the Nielsen™ rating system is perhaps one of the best known media measurement systems. Established in the 1950's, the Nielsen rating system today utilizes monitoring devices at a set of selected user sites to monitor television viewing habits.

1 The Nielsen rating system generates statistical information regarding the number of
2 viewers who have viewed programming on a particular television channel during a
3 particular period.

4 The Nielsen rating system does not provide information regarding the
5 advertisements that were watched by the viewers. For example, the Nielsen rating
6 system may report that 10 million viewers watched a particular television episode
7 during one particular week. However, no indication is provided regarding the number
8 of viewers that watched a particular advertisement -- which was shown during that
9 television episode and was also shown at other times, on the same and other channels
10 -- during that week.

11 A system other than the above-described program rating system collects data
12 on advertisements which are broadcast. It does this by essentially monitoring all
13 television channels and collecting data on the number of times a particular
14 advertisement is broadcast. This system monitors the source of the advertisement (by
15 monitoring the television broadcasts) and, therefore, cannot directly provide
16 information on the number of viewers who viewed a particular advertising campaign
17 during a particular time period. While this data may be combined with data from the
18 Nielsen rating system in order to estimate the number of times a particular
19 advertisement was viewed, this process is, of course, cumbersome and not always
20 accurate.

21 Further, and perhaps of more relevance to the present invention, it is
22 essentially not possible to collect data from all "broadcasts" at the source in a

SUMMARY OF THE INVENTION

In accordance with these and other objects of the invention, a brief summary of the present invention is presented. Some simplifications and omissions may be made in the following summary, which is intended to highlight and introduce some aspects of the present invention, but not to limit its scope. Detailed descriptions of a preferred exemplary embodiment adequate to allow those of ordinary skill in the art to make and use the inventive concepts will follow in later sections.

According to broad aspects of the invention, methods and apparatuses for providing information regarding the number of visits to pages on a data network such as the Internet and banner images encountered on network pages are described. The described embodiments overcome a number of issues faced by prior art systems, including providing for improved accuracy in measuring the number of times a banner image or advertisement is viewed; providing improved methods and apparatuses for efficiently identifying unique banner images viewed; providing an improved method and apparatus for configuring a network user's computer so that interference from the collection of data with the normal operation of the computer is minimized; providing an improved method and apparatus for efficiently calculating an image checksum to allow unique identification of a banner image viewed by an end user; and providing an improved method and apparatus for determining whether the network user has used the *BACK* button of an Internet browser to view a page and, if so, to accurately count the number of banner images viewed.

[illegible]

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a representation of an Internet page as may be monitored by an embodiment of the present invention.

Figure 2 is an overall diagram of a network as may be utilized by an embodiment of the present invention.

Figure 3A is a high level block diagram of a first embodiment of a client computer as may be utilized by the present invention.

Figure 3B is a high level block diagram of a second embodiment of a client computer as may be utilized by the present invention.

Figure 4 is a flow diagram illustrating a data collection method as may be implemented by an embodiment of the present invention.

Figure 5 is a flow diagram illustrating a method of identifying banner images in Internet pages as may be utilized by the present invention.

Figure 6 is a representation of an Internet page using frames as may be monitored by an embodiment of the present invention.

Figure 7 is a flow diagram illustrating a method of monitoring frame pages as may be utilized by an embodiment of the present invention.

Figure 8 is a flow diagram illustrating a method of BACK button processing as may be utilized by an embodiment of the present invention.

Figure 9 is a diagram illustrating certain panel member demographics which may be utilized by an embodiment of the present invention.

1 Figure 10 is an illustration of a report format as may be utilized by an
2 embodiment of the present invention.

3 Figure 11 is an overall flow diagram of a method of retrieving images as may
4 be utilized by the present invention.

5 For ease of reference, the numerals in all of the accompanying drawings are
6 usually in the form "drawing number" followed by two digits, xx; for example,
7 reference numerals on Figure 1 may be numbered 1xx; on Figure 3, reference
8 numerals may be numbered 3xx. In certain cases, a reference numeral may be
9 introduced on one drawing and the same reference numeral may be utilized on other
10 drawings to refer to the same item.

11

Accepted for filing

DETAILED DESCRIPTION OF
THE EMBODIMENTS THE PRESENT INVENTION

I. OVERVIEW OF HTML FOR BANNER IMAGES

Figure 1 illustrates an Internet page 101 which includes a separate image 102 that could be a hyperlink represented as a graphic "button", or a banner containing an advertisement. The image 102 is also referred to herein as a "banner image," "image," "advertisement" "banner" or simply an "ad." A network user viewing the Internet page (a "viewer," "end user" or "panel member") may ignore the banner image 102, simply look at the banner image 102 or, more actively, select the banner image 102 (such as by clicking on it with a cursor control device). By selecting the banner image 102, the viewer may be presented with another Internet page which may provide, for example, another page of information or another page providing more detail on a company placing an advertisement or on a product being advertised in the banner image 102. Alternatively, the banner image 102 may provide one form or another of rich new media such as audio or video programming content.

Internet pages are typically constructed using a programming language called hypertext markup language (HTML). It is, in fact, the HTML code which is transmitted from an Internet server to the requesting machine in response to a viewer requesting a particular Internet page or site (identified by its uniform resource locator or "URL"). Internet pages which include banner images 102 have encoded in their HTML what will be termed herein "anchor pairs". An anchor pair comprises the HTML code for the URL to contact if the user selects the banner image 102, together

1 with the URL for the image to display in the banner. An example of an anchor pair is
2 shown below in Table I.

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TABLE I ANCHOR PAIR

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href="http://www.digitalriver.com/dr/v2/ec_MAIN.Entry17c?
CID=5560&SID=6505&SP=10007&PN=5&PID=100853">Buy Speedlane Software
Online!</A> </FONT></B></P><TABLE WIDTH="120" BORDER="0"
CELLPADDING="0" CELLSPACING="0" ALIGN="RIGHT"><TR>
<TD><IMG SRC="/graphics/spacer.gif" WIDTH="20" HEIGHT="4" BORDER="0"
ALIGN="BOTTOM"></TD><TD><a
```

There is not necessarily a one-to-one correspondence between advertising
images and the URL encoded in the HTML for the anchor pair. In fact, there may be
a many-to-many correspondence. For example, the advertising image may be
provided from an advertising server. Thus, the particular image served may vary
every time that an Internet page is accessed although the URL for the page remains
constant. An example of the HTML for this is shown in Table II.

TABLE II ANCHOR PAIR

```
<a href="/cgi-bin/gen_addframe.cgi?addhref=http://209.1.112.252/cgi-
bin/redirect/follow.cgi%3fdc%3dsCA%2bz94086%2bcUS%2bgM%2baR%2bm9%2bn9%2bi
H%2blG%2beS%2bjP%2bqC%2buO%2bw0%2bh2058%2bd1%2bd2%2bd4%2bd7%2bd11
%2bbN%2bo5%2btF&login=xxxxx" onMouseOver="self.status='Please click on the banner
for more information'; return true" target="_top">

</a></td></tr>
```

Moreover, the same advertising image may be associated with any number of URLs. For example, a particular advertiser may contract with multiple advertising server companies to place its advertisement on multiple Internet pages. There will be at least one, if not many, different URLs used by each advertising server company to serve the advertisement.

Thus, it is not possible to accurately track the number of times an advertisement is viewed by simply tracking URLs.

II. OVERVIEW OF AN EXEMPLARY EMBODIMENT FOR TRACKING INTERNET BASED ADVERTISMENT VIEWING

Similar to the Nielsen rating system, it is possible to recruit a panel of viewers which provide a statistically representative sample of a population of data network users, such as Internet users, in order to provide statistically interesting data regarding data access habits and preferences.

In one exemplary embodiment, an index group of approximately 2000 Internet users was developed using random digit dialing to insure demographic accuracy and projectability of the panel member's behavior to the population of Internet users. After demographic profiles of the index panel were established, an additional 23,000 (for 25,000 total) members that fit the demographic profiles were selected via Internet recruiting. Internet recruiting is a relatively cost effective method of recruiting panel members. Periodic, e.g., quarterly, re-calibration of the index panel is employed in

1 the process of recruiting new panel members to reflect the changing population of the
2 Internet user community.

3 When a panel member is selected, the panel member completes a survey
4 which identifies certain key demographic and psychographic data to allow a profile of
5 the user to be built. As will be described below, the panel member then instructs his
6 or her computer to allow the collection of information regarding advertisements
7 received by the panel member's computer while the panel member is "surfing the
8 Internet".

9

10 *III. OVERALL ARCHITECTURE*

11 Figure 2 provides a high level overall view of the architecture of one preferred
12 embodiment of the present invention. In Figure 2, the general relationship among the
13 features of the system is shown as used in a distributed network environment 210
14 such as the Internet.

15 A plurality of panel member client/viewer terminal devices or computers 201
16 are configured to collect information relating to specific banner images 102, such as
17 advertisements. These advertisements are typically viewed as a result of accessing
18 world wide web sites or pages on the Internet 210. The panel member computers 201
19 may be based on any of a number of platforms executing various operating systems
20 and browsers. For example, the platform may be executing any of a number of
21 different operating systems including UNIX, the Macintosh OS™, or the Windows™
22 operating system. The platform may also be executing any of a number of Internet
23 browsers including, for example, browsers available from Netscape Corporation or

1 Microsoft Corporation or browsers available from online service providers such as
2 AOL, Compuserve or Prodigy. Advantageously, the present invention requires little,
3 if any, modification for use on these varying platforms and is relatively simple to
4 install.

5 It should be understood that the references to specific programs or components
6 typically found in general purpose computer terminals and servers, related to but not
7 forming part of the invention, are provided for illustrative purposes only. References
8 to computer programs and components are provided for ease in understanding how
9 the present invention may be practiced in conjunction with known types of on-line
10 database and data network/Internet applications. Moreover, it is important to
11 understand that the various components of the system contemplated by the present
12 invention may be implemented by software programs, by direct electrical connection
13 through customized integrated circuits, or a combination of circuitry and
14 programming, using any of the methods known in the industry for providing the
15 functions described herein without departing from the teachings of the invention.
16 Those skilled in the art will appreciate that from the disclosure of the invention
17 provided herein, both programming languages and commercial semiconductor
18 integrated circuit technology would suggest numerous alternatives for actual
19 implementation of the functions herein that would still be within the scope of the
20 present invention.

21 In one preferred embodiment, the computers 201 are further configured with a
22 proxy server architecture. Use of the proxy server architecture provides a number of

1 advantages including ease of portability from platform to platform. The proxy server
2 architecture will be described in greater detail with reference to Figures 3A & 3B.

3 Data is collected by a proxy server 306 when a panel member's computer 201
4 accesses a distributed network 210. The collected data is transmitted back over the
5 distributed network 210, in this example the Internet, and is reported to a panel server
6 221. The collected data includes, among other items, a banner image link URL, a
7 banner image URL, and a checksum/length field for each banner image 102 presented
8 to or viewed by a panel member. The panel server 221 receives the collected data,
9 and logs it in one or more data logs 307.

10 The panel server 221 preferably executes on a NT/Pentium based general
11 purpose computer. In the described embodiment, a plurality of panel servers 221 are
12 provided in order to assure high availability and fast user access. The particular
13 number of panel servers 221 may vary from embodiment to embodiment and may
14 depend on such as factors as the size and speed of the panel server 221, the number of
15 panel members in the sample population, etc.

16 The panel server 221 also provides the collected data to a database server 233
17 for further processing. The database server 233 performs the function of overall
18 database management for the system of the present invention. In the described
19 embodiment, an Oracle relational database server is utilized. However, alternative
20 embodiments may utilize any of a number of database servers and, in fact, the
21 database server 233 may utilize either a relational or non-relational database without
22 departure from the spirit and scope of the present invention.

1 In the described embodiment, there are two main sources of data. First,
2 demographic data is collected and stored with respect to the makeup of the members
3 of a panel. The demographic data may include information such as gender, age,
4 marital status, educational level, race, employment status, income level, industry of
5 employment, occupation, and geographic region information. It is anticipated that a
6 panel of 25,000 members will generate about 300MB of data per day, to be received
7 and processed by the database server 233.

8 The database server 233 stores the banner images 102 for each unique banner
9 image 102 that is encountered. The database server 233 performs the function of
10 correlating the foregoing data to generate reports, as will be described in greater detail
11 below.

12 Periodically (e.g., daily), an analysis engine 234 analyzes the data correlated
13 by the database server 233 and stored in the database. The analysis engine 234
14 performs several tasks, including that of obtaining the banner images 102 for each
15 advertisement presented to a panel member. As described above, there is a many-to-
16 many relationship between the advertisement images and the URLs. A method for
17 determining the particular advertisement image viewed is described in greater detail
18 below.

19 Subscribers to the system may access the database in order to obtain reporting
20 on advertisements viewed. In the described embodiment, the subscribers may access
21 the database through a HTTP server 235. In alternative embodiments, subscribers
22 may be given alternative access. For example, subscribers may be given direct dial-in
23 access or may be provided with reports periodically by facsimile, mail or email.

IV. CONFIGURATION OF THE PANEL MEMBER'S COMPUTER

One method of configuring a panel member's computer is illustrated generally in an exemplary embodiment shown in Figure 3A. In Figure 3A, a panel member's computer 201 is configured by installing metering software 303 designed to intercept messages communicated between the operating system 304 and a browser 305. While this technique may be utilized in certain embodiments of the present invention, design and development of metering software 303 for each of the many platforms which may need to be supported is likely to be cumbersome because the metering software 303 must be customized for each browser/operating system combination. It should be noted that configuration of a panel member's computer 201 may be accomplished by any of a number of techniques that implement the foregoing functions without departing from the inventive aspects of the present invention. For example, in the embodiment described above, the present invention combines the proxy server 306 with a browser 305 to intercept messages communicated between the operating system 304 and a browser 305 (see Figure 3B).

It has been discovered that it is advantageous to configure the computer 201 as illustrated in Figure 3B, by providing the proxy server 306 to collect data related to the banner images 102 accessed by a panel member. One distinct advantage of use of the proxy server 306 over metering software 303 is that use of the proxy server 221 allows for the development of relatively portable code.

V. SYSTEM OPERATION

The components of Figure 3B are best understood by referring to the system's data collection process illustrated in the flowchart shown in Figure 4. In operation, a panel member first selects a URL using any of a number of conventional browsing methods, such as selecting a hyperlink or directly typing the URL into the an Internet browser 305 (Block 401). The proxy server 306 intercepts the URL request (Block 402) and passes the URL request onto the Internet 210, where the request is served in the conventional manner (Block 403).

The proxy server 306 then initiates generation of what will be termed a "captured data record" (Block 404). The captured data record provides information relating to the URL request, the HTML data received, the panel member's use of the Internet page, and advertising banner images 102 encountered on the Internet page. In one embodiment of the present invention, the captured data record preferably comprises the information identified below in Table III:

TABLE III

	FIELD	DESCRIPTION
1	VERSION NUMBER	Version number of proxy software
2	SITE ID	Used by the panel server and database server to identify the panel member's computer
3	USER ID	Used by the panel server and database server to identify the panel member
	REQUESTED URL	The URL requested by the panel member

4		
5	METHOD	HTTP methods supported by the target of the hypertext link. The most common methods are GET, HEAD and POST.
6	REFERRER	The URL of the referring page (only applicable in the case of a hyperlink)
7	REQUEST TIME OF URL (GMT)	The time of day that the user requested the URL (in GMT)
8	REQUEST TIME OF URL (LOCAL)	The time of day that the user requested the URL (in local time)

In addition, the following fields, shown in Table IV are generated or collected for each banner image 102 found in the HTML page that is viewed:

	FIELD	DESCRIPTION
9	BANNER IMAGE ANCHOR URL	The URL of the banner image 102 anchor (page to go to if the panelist clicks on the banner image 102)
10	BANNER IMAGE URL	The URL of the banner image 102
11	CHECKSUM	A calculated checksum for the banner image 102.
12	LENGTH	The length of the banner image 102 in bytes

The length of each captured data record is approximately 500 bytes. Keeping the amount of captured data which must be transmitted to the panel server 221 minimal is important to avoid undue interference with the performance of the panel member's computer 201. The operation of the present invention must be as unobtrusive as possible so that it does not unnecessarily interfere with the panel member's experience while accessing the Internet. Interference with the panel member's experience may result in changes in the behavior of the panel member and,

1 in the case of significant interference, may result in the panel member removing
2 himself or herself from the pool of panel members.

3 It should be noted that in alternative embodiments, alternative types of
4 browsing data may be transmitted with the captured data record, which may have an
5 impact on the overall length of the captured data record and the level of useful
6 information collected. For example, in addition to transmitting the URL of the banner
7 image 102, the full image may be transmitted. While transmitting the full banner
8 image 102 may provide useful information for the analysis engine 234, transmission
9 of the full banner image 102 is relatively expensive both in terms of bandwidth
10 consumed in transmission of the image and in terms of storage requirements.

11 Instead of transmitting the data for each entire banner image 102, a checksum
12 is preferably calculated for the banner image 102 and reported in the captured data
13 record. In one embodiment of the present invention, the checksum is calculated
14 against only a sampling of the banner image 102. The amount of image data sampling
15 is variable, and can be set based on the desired exactness in identifying specific
16 banner images 102. By calculating the checksum against only a sampling of the
17 banner image 102, processing bandwidth is saved when compared with calculating
18 the checksum for the entire image. For example, in the described embodiment, only
19 recurrent bytes (e.g., every 4th or 5th byte) are used in the checksum calculation.

20 While using only a portion of the banner image 102 to calculate a checksum
21 can advantageously reduce processing requirements, it does not provide the same
22 level of assurance that the checksum will represent a unique value identifying, for
23 example, an advertisement, as would be provided if the checksum were calculated for

1 the entire banner image 102. As can be understood, varying the checksum sampling
2 rate allows for varying the reliability of the results against the benefit of saving
3 computational cycles and bandwidth.

4 At times there may be only minute differences between two images 102, such
5 as where two advertisements are produced by a single advertiser. In such a case, if
6 the differences do not occur in the recurrent bytes sampled to generate the checksum,
7 the checksum will not uniquely identify the advertisement image. To overcome this
8 problem, the total length of the advertising image is calculated in addition to the
9 checksum. In one embodiment of the present invention, the length of the banner
10 image 102 in bytes is determined and provided in the captured data record for the
11 page.

12 This combination of checksum and length values are used to uniquely identify
13 each specific banner image 102 that is encountered. It is been determined empirically
14 that, while not providing absolute assurance that the checksum/length combination
15 will always identify a specific advertising image, the use of the combined
16 checksum/length value is sufficiently reliable for purposes of the described
17 embodiment.

18 It is worthwhile pointing out that in alternative embodiments, alternative
19 information may be used to uniquely identify a banner image 102. One example was
20 briefly discussed above—storing and transmitting the entire banner image 102, with
21 the inherent sacrifice in storage and transmission bandwidth. As also discussed
22 above, a checksum could be calculated on the entire banner image 102 with the
23 inherent additional costs in processing, storage and transmission requirements. For

1 purposes of the discussion herein, data uniquely identifying a banner image 102,
2 regardless of the method used to generate the identifying information, will be referred
3 to generically as a "unique banner image identifier". Generating a unique banner
4 image identifier for identifying a specific image eases the process of counting and
5 analyzing the number of times a particular image has been displayed.

6 Unlike the banner image data, certain of the fields in the captured data record
7 may be determined prior to receiving the HTML data (e.g., USER ID and REQUEST
8 TIME OF URL) while other fields will necessarily have to be determined after the
9 HTML data is received. In any event, the HTML data corresponding to the requested
10 URL is eventually received by the proxy server 306 (Block 405). The proxy server
11 306 then passes the HTML data onto the browser 305 (Block 406).

12 As one important aspect of the present invention, the proxy server 306
13 examines the HTML data to find additional banner images 102. Each captured data
14 record may include data relating to 0-*n* banner images 102, depending on the number
15 of banner images 102 found in the HTML data. The proxy server 306 completes its
16 generation of the captured data record and communicates the captured data record
17 over the network 210 to data log 307 (Block 407). The data are also communicated
18 over the network 210 to the panel server 221 (Block 408).

19 Turning now to Figure 5, a method of identifying banner images 102 as may
20 be implemented in the described embodiment is illustrated. Initially, the HTML code
21 of a page that a panel member is viewing is scanned for anchor/banner image 102
22 pairs (Block 501). As described above, anchor/banner image 102 pairs contain the

1 HTML code for the URL to contact if the user selects the banner image 102, together
2 with the URL for the image to display in the banner 102.

3 The system of the present invention scans the entire HTML page for all
4 anchor/banner image 102 pairs, and if no anchor/banner image 102 pair is found, then
5 the process completes without going through any banner identification (Block 503 to
6 END).

7 If a pair of anchor/banner images 102 is found (Block 503), the present
8 invention (optionally) filters the anchor/banner image 102 pairs to screen out images
9 which do not likely represent banner images 102 based on the image size (Block 504).
10 For example, images such as graphic "buttons" to be clicked on for hyperlinking
11 could be confused for advertisements if any image size is accepted. Image size is
12 determined by multiplying the width of the image times the height of the image (in
13 pixels). One embodiment of the present invention uses a minimum image size
14 threshold to filter images. In another embodiment, the filtering process requires that
15 the image size exceed a first threshold but be smaller than a second threshold.

16 The filter thresholds in the described embodiment are variable, and may be set
17 based on empirical observations that the size of particular banner images 102, such as
18 advertisements, likely fall within a certain range. For example, as the size of
19 advertising banner images 102 becomes increasing standardized, it should be easier to
20 filter out images which do not fit within one of the standard sizes.

21 If an image does not pass the filtering process (Block 506), the system then
22 checks if more HTML code is present and reverts to Block 501 to continue scanning
23 the remainder of the HTML code for any banner images 102 that may be present.

1 After all of the HTML code is scanned and no images are found, the process is
2 completed. If an image does pass through the preset thresholds of the filtering
3 process (Block 506), then the combination checksum/length value is computed for the
4 banner image 102 in the process described above to identify the specific
5 advertisement (Block 508). The entire process is completed for each image found as
6 the remainder of the HTML code of the page is scanned (Block 509).

7 The system of the present invention is designed to perform the foregoing
8 processes even if the HTML page received utilizes frames technology. An HTML
9 page using frames is shown in Figure 6. Since there are 3 sub-pages in the
10 exemplary page illustrated by Figure 6, there will be 4 URLs downloaded by the
11 browser. They are represented generally as:

12 <http://domain.com/mainframe.html>
13 <http://domain.com/sub-page1.html>
14 <http://domain.com/sub-page2.html>
15 <http://domain.com/sub-page3.html>
16
17

18 The downloading sequence is typically the "Main frame" first, followed by the
19 three sub-pages. The three sub-pages are downloaded concurrently via multithreads
20 by the browser 305. As was described above, the proxy server 306 is designed to
21 transmit to the panel server 221 one captured data record for each HTML page
22 viewed. In non-frames HTML, a single HTML page corresponds to a single URL
23 being downloaded by the proxy server 306. As is seen, in a frame HTML page, a
24 single page may require multiple URL requests. However, it is still desirable to send
25 a single data record that corresponds to the panel member's access of the multi-frame

1 page. Thus, as another aspect of the present invention, a method is disclosed for
2 detecting that a HTML page is a frame page and transmitting a single captured data
3 record to the panel server 221 for each frame page.

4 Referring now to Figure 7, the method is described in greater detail. Initially,
5 each page of HTML code that is received is parsed to identify the HTML tag
6 "FRAME" or "IFRAME" (Block 701). If the tag is not found (Block 702), the page is
7 identified as not being a main page for a frame, and is processed (searching for banner
8 images 102, adding up the page length, etc.) in accordance with the methods
9 described above (Block 703).

10 If the tag is found, the system initiates the identification of any sub-frames that
11 may exist. As understood by those skilled in the art, sub-pages of a frame are
12 typically received by the user's computer 201 within a predetermined amount of time
13 after the main frame is received. In the present invention, all pages received before
14 the next hyperlink selection or the entering of a URL by a panel member (a page with
15 a FRAME tag), are identified as sub-pages (Block 704). The length of all sub-pages
16 is included with the length determined for the main page, and the combination of data
17 is included in the captured data record for the main page (Block 705). In addition, all
18 banner images 102 in each of the sub-pages is identified using the processes described
19 above, and the data for such images 102 are generated along with the captured data
20 record of the main page (Block 706). As can be seen, the data related to each sub-
21 page is handled in combination with the data for the main page of a multi-frame page.

22 Turning now to Figure 8, a method for accounting for use of the BACK button
23 of a browser 305 is explained. When a user clicks the BACK button of the browser

1 image 102 having a checksum/length value matching the reported checksum length
2 was not found in the distributed network 210 (Block 921).

3 If a match was found during one of the retry processes (branch 916), the image
4 and its checksum/length value are added to the database (Block 922).

5 Table V further illustrates the processing performed by the analysis engine 234
6 for possible HTML return codes and banner image 102 information (see Table III and
7 IV), the cause associated with the return codes, and the processing required by the
8 analysis engine 234 for handling particular page conditions. In Table V, "An"
9 represents the anchor link of banner image 102, "In" represents the image of the
10 banner image 102, "Ln" represents the image length, "Cn" represents the image
11 checksum, "-1" for the length represents an unknown image length and Ax,Ix,Lx,Cx
12 represents any other existing data.

13
14 TABLE V
15 HTML RETURN CODE / BANNER IMAGE 102
16 INFORMATION PROCESSING

Case	Why It Happens	Process Needed
200 only	Full HTML page retrieved, page contains no banner image 102	Normal process; send information from Table III to panel server

200+An+In+Ln+Cn	Full HTML page retrieved, page contains banner images(s) 102	<ol style="list-style-type: none"> 1. If (An,In) does not exist, new banner image 102 master will be created with (Ln,Cn) 2. If (An,In) exists with (-1,0), replace this banner image 102 with data (Ln,Cn) 3. If (An,In) exists with multiple (Ln,Cn), create a new one.
200+An+In+-1+0	Full HTML page retrieved. Page contains banner image 102(s) but the banner image 102 is already in browser's cache.	<ol style="list-style-type: none"> 1. If (An,In) does not exist, new banner image 102 master should be created with (-1,0). 2. If (An,In) exists and only has one instance of (Ln,Cn), do not create new banner image master. Existing banner image 102 will be used. 3. If (An,In) exists with multiple (Ln,Cn), random pick one.
304 only	HTML page in cache. No image(s) is loaded by browser.	<ol style="list-style-type: none"> 1. Copy all banner images 102 from latest 200 page. 2. If no 200 page is found, ignore banner images 102.

<p>304+An+In+Ln+Cn</p>	<ol style="list-style-type: none"> 1. HTML page in cache. 2. New banner image 102 found. Banner image 102(s) can be created from sub-frame page or Java script. 3. Image 102 is retrieved also. 	<ol style="list-style-type: none"> 1. Copy banner images 102 from latest 200 page. 2. If (An,In,Ln,Cn) exists, ignore the new banner image 102. 3. If (An,In)s exist but have different (Lx,Cx), replace all copied (An,In,Lx,Cx) with new (An,In,Ln,Cn). 4. If (An)s exist but have different (Ix,Lx,Cx), replace all copied (An,Ix,Lx,Cx) with (An,In,Ln,Cn). 5. If no match, create one. <p>Note: All (An,In,Ln,Cn) etc. in 304 case only talk about the banner image 102 instances copied from 200 page.</p>
<p>304+An+In+-1+0</p>	<ol style="list-style-type: none"> 1. HTML in cache. 2. New banner image 102 found. 3. Banner image 102 is in browser's cache, so no banner image 102 is reloaded. 	<ol style="list-style-type: none"> 1. Copy banner images 102 from latest 200 page. 2. If (An,In) exists, use copy version 3. If (An) exists, replace (An,Ix,Lx,Cx) with (An,In,-1,0) 4. If no match and there is only one banner image 102 in 200 page, drop old one use new one (An,In,-1,0) 5. If no match and there are multiple banner images 102 in 200 page, create a new banner image 102.

n 304+null+In+Ln+C	1. HTML page in cache 2. New image(s) is retrieved	1. Copy banner images 102 from latest 200 page 2. If (Ax,In,Lx,Cx) exists, replace it with (Ax,In,Ln,Cn) 3. If no match, ignore
304+null+In+-1+0	1. HTML page in cache 2. Image reloaded but either the image is redirected to a cached image or returned with 304	ignore

VI. SUBSCRIBER REPORTING

Once the foregoing data has been collected, the system of the present invention generates comprehensive subscriber reports. The reports include data detailing top Internet sites accessed during a particular period, Internet site reports detailing specific information on activity at particular sites, and ad summary reports summarizing information relating to particular advertisements or banner images 102. The reports may cover any given time period, for example, weekly, monthly or quarterly time period.

In particular, in the described embodiment, five reports are provided showing information relating to top Internet sites including: (i) Top Internet Sites by Unique Site, (ii) Top Internet Sites by Property, (iii) Top Referring Sites by Unique Site, (iv) Top Internet Sites by Domain and (v) Top Navigation Guides by Unique Site. The reports provide information regarding site audience, Internet activity and profile

1 information which include rank, unique audience size, reach, page views, pages
2 viewed from browser cache and pages viewed per person. The SITE_ID and
3 USER_ID are used to uniquely identify a user profile in order to provide demographic
4 information for reporting.

5 In addition to these reports, on-line access to the database is provided by, for
6 example, the HTTP server 235 (see Figure 2) which allows template-driven queries,
7 thereby providing customized reports. Other reports available include (i) a
8 Demographic Targeting--Site report providing statistically significant sites based on
9 selected audience characteristics; (ii) a Demographic Targeting--Banner Image report
10 which provides data related to the statistically significant banner images 102 viewed
11 by the target audience; (iii) an Audience Profile--Site report which profiles and
12 compares up to three selected sites demographics, unique audience, composition and
13 coverage site; (iv) an Audience Profiles --Banner Image report which provides
14 audience profiles for selected banner images 102 and includes unique audience,
15 composition, impressions, click rate, reach and frequency with all demographic
16 groupings.

17 What has been described herein is a method and apparatus for accurately and
18 efficiently counting the number of times an image 102 is viewed by a user of an on-
19 line database or data network, such as the Internet. Although the present invention
20 has been described in detail with particular reference to preferred embodiments
21 thereof, it should be understood that the invention is capable of other and different
22 embodiments, and its details are capable of modifications in various obvious respects.
23 As is readily apparent to those skilled in the art, variations and modifications can be

1 affected while remaining within the spirit and scope of the invention. Accordingly,
2 the foregoing disclosure, description, and figures are for illustrative purposes only,
3 and do not in any way limit the invention, which is defined only by the claims.

4

5

[illegible]

CLAIMS

_What is claimed is:

1. A method of providing information on advertisements viewed comprising:
 - a) instrumenting a viewing device with an instrumentation program;
 - b) receiving information at the viewing device, the information including advertisements; and
 - c) collecting information identifying the advertisements received.
2. The method as recited by claim 1 wherein a sample of a population of viewing devices are instrumented with the instrumentation program.
3. The method as recited by claim 1 wherein the advertisements are banner images.
4. The method as recited by claim 1 wherein the collected information comprises a banner image 102 URL, a checksum and a length.
5. A method of determining the reach and frequency of view of an advertisement comprising:
 - a) instrumenting a viewing device with an instrumentation program;
 - b) receiving information at the viewing device, the information including advertisements; and
 - c) collecting information identifying the advertisements received.

6. The method as recited by claim 5 wherein a sample of a population of viewing devices are instrumented with the instrumentation program.
7. The method as recited by claim 5 wherein the advertisements are banner images.
8. The method as recited by claim 5 wherein the collected information comprises a banner image 102 URL, a checksum and a length.
9. A panel computer comprising a first stored program for browsing a distributed network and a second stored program for instrumenting the computer to report information regarding the advertising images viewed on the computer, the computer comprising:
 - a) a first port coupled in communication with the distributed network;
 - b) a first storage area storing the first stored program, the first stored program when executed causing the computer to allow user controlled access to the distributed network; and
 - c) a second storage area storing the second stored program, the second stored program when executed causing the computer to collect statistics on advertisements retrieved from the distributed network and viewed on the computer, the second stored program collecting information regarding the advertisements viewed.
10. The panel computer as cited by claim 9 wherein the advertisements are banner images.

11. The panel computer as recited by claim 9 wherein the collected information comprises a banner image 102 URL, a checksum and a length.
12. The panel computer as recited by claim 9 wherein the distributed network is the Internet.
13. A method of collecting information regarding advertisements viewed by a client computer communicating with a distributed network, the method comprising the steps of:
 - a) receiving an advertising image from the distributed network at the client computer;
 - b) deriving a unique identifier identifying the advertising message;
 - c) reporting the unique identifier to an analysis engine.
14. The method as recited by claim 13 wherein the unique identifier comprises a checksum.
15. The method as recited by claim 13 wherein the unique identifier comprises a checksum and the length of the advertising image.
16. The method as recited by claim 13 wherein the step of reporting to the analysis engine is accomplished by transmitting a message over the distributed network from the client to a server, the message including the unique identifier.

ABSTRACT OF THE DISCLOSURE

A method and apparatus for allowing the collection of information regarding visits to the pages of a data network such as the Internet, and the number of separate images viewed is described. The described method overcomes various prior art limitations including providing for improved accuracy in reporting the number of times a banner image, such as an advertisement, is viewed; providing improved methods and apparatuses for efficiently identifying unique banner images viewed; providing an improved method and apparatus for configuring a network user's computer so that interference from the data collection process with the normal operation of the computer is minimized; providing an improved method and apparatus for efficiently calculating a checksum to allow unique identification of a banner image viewed by a network user; and providing an improved method and apparatus for determining whether the network user used the browser BACK button to view a page and, if so, to count the banner images viewed.

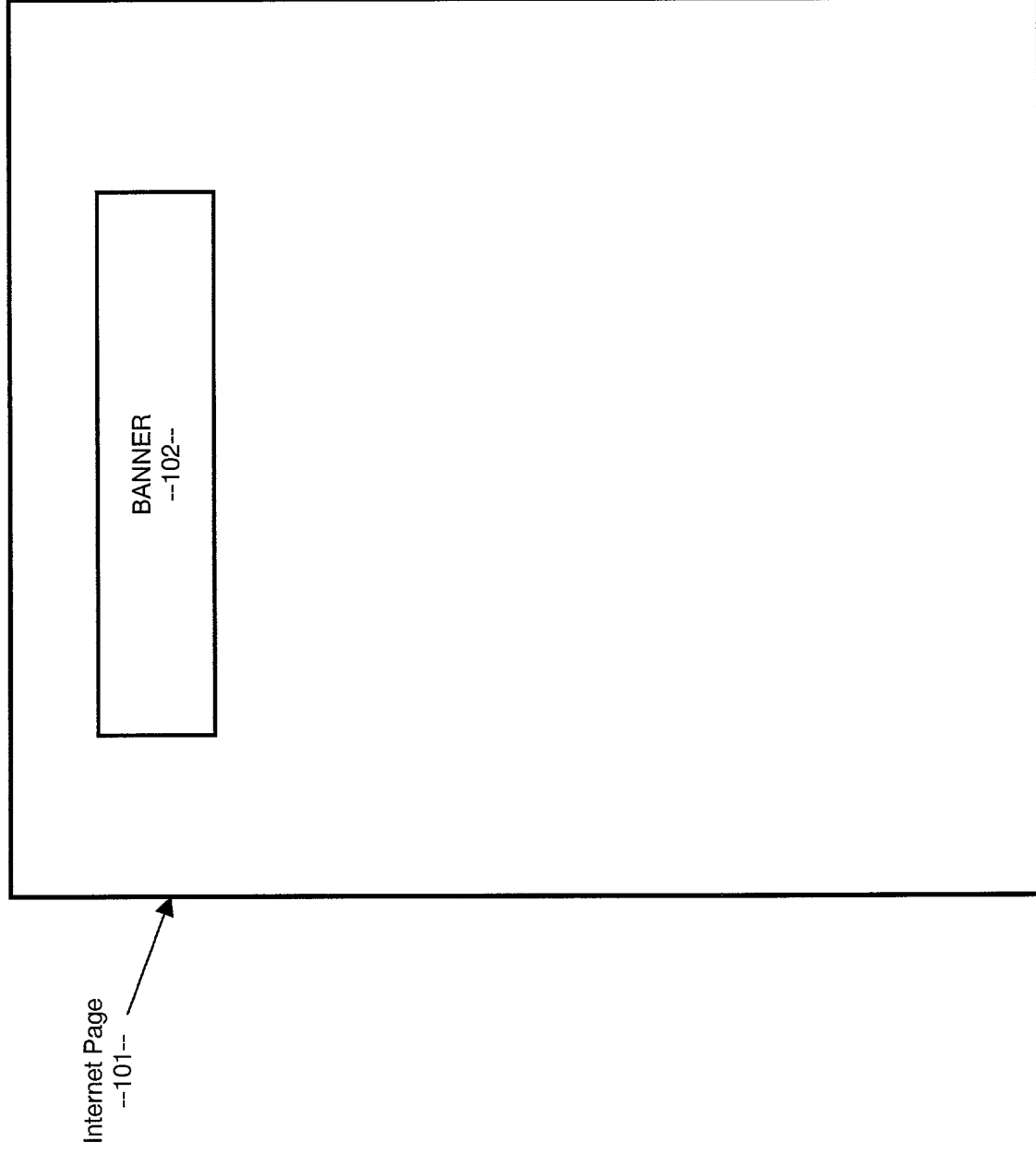


FIGURE 1

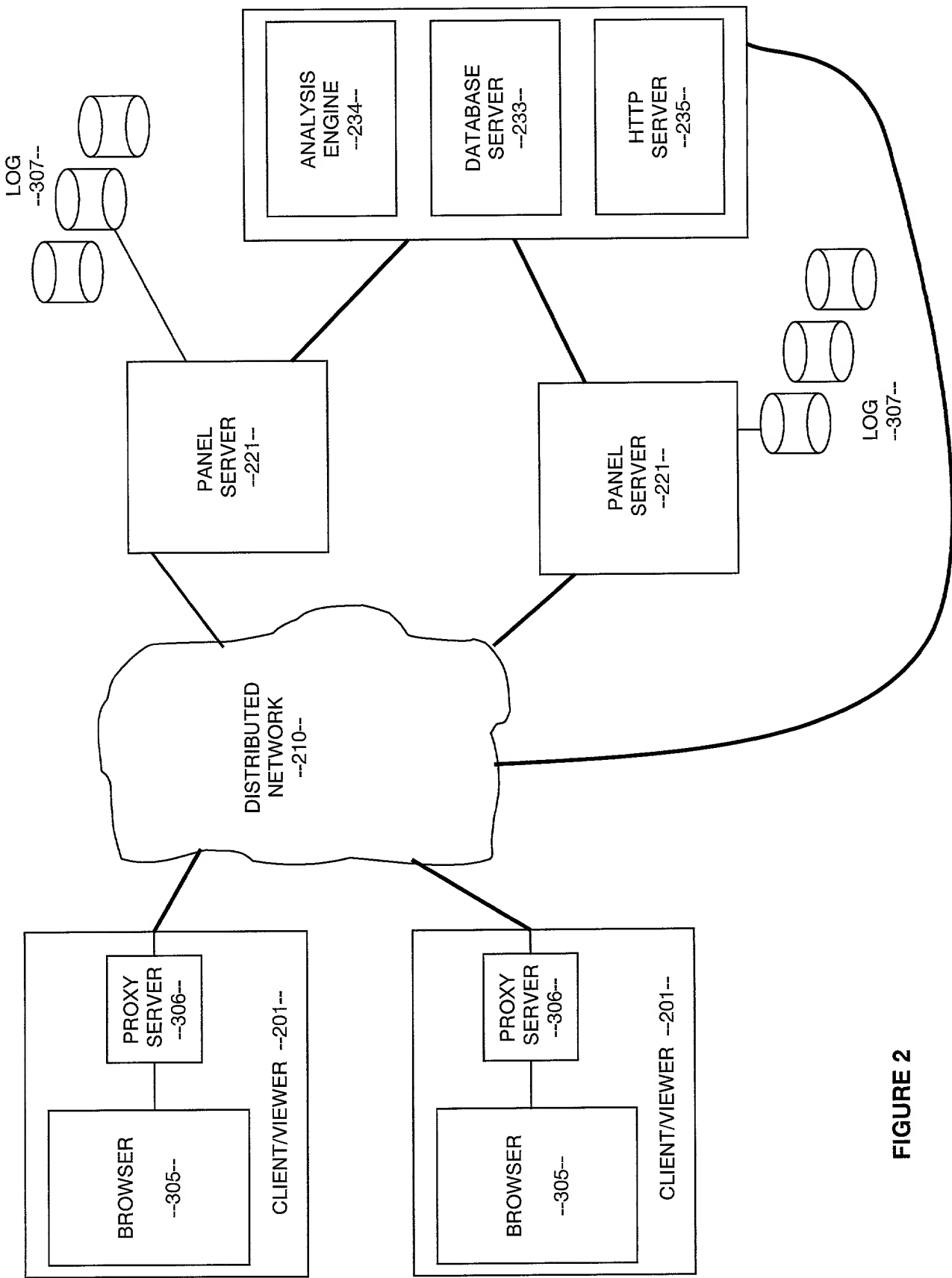


FIGURE 2

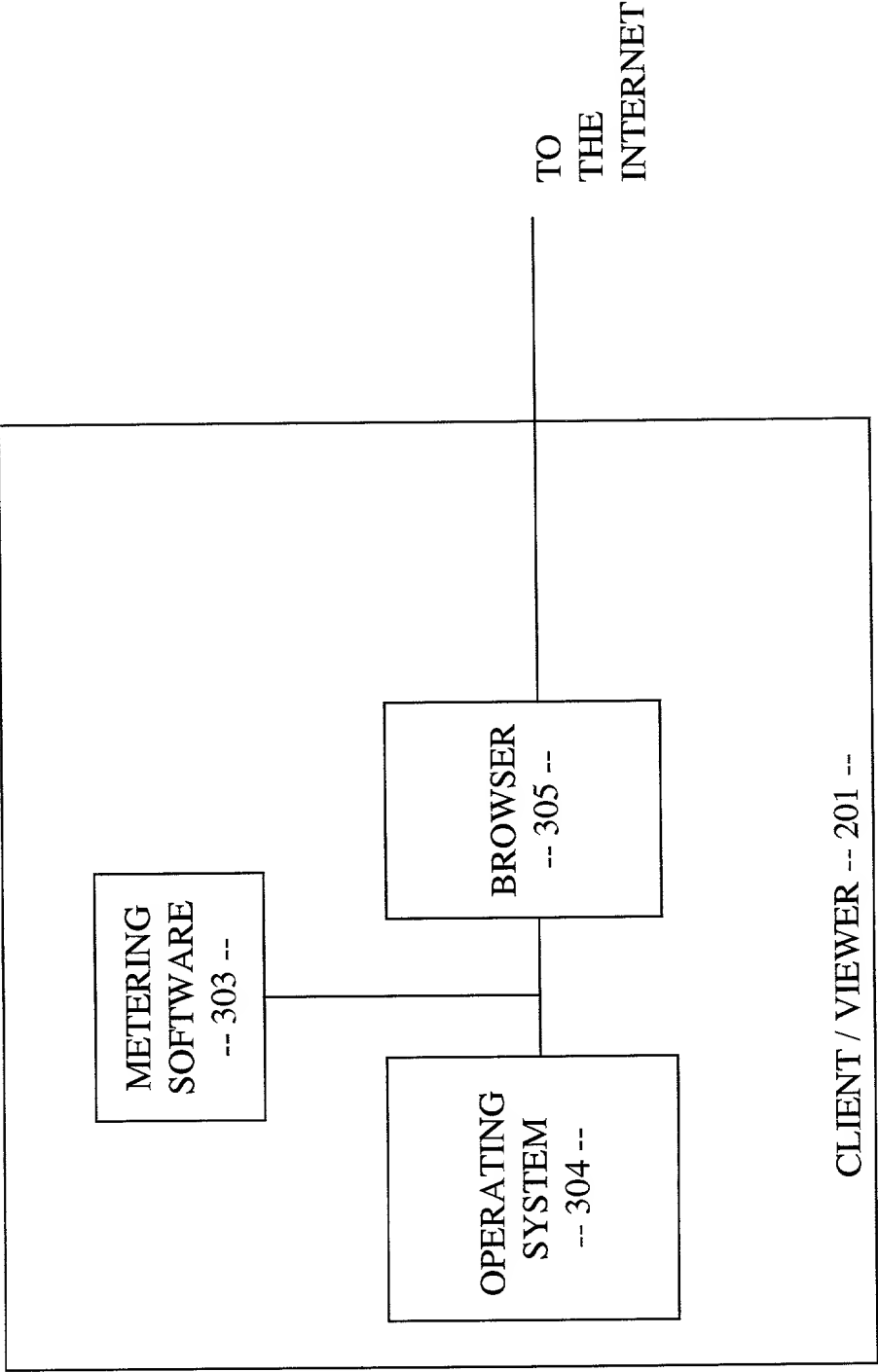


FIGURE 3A

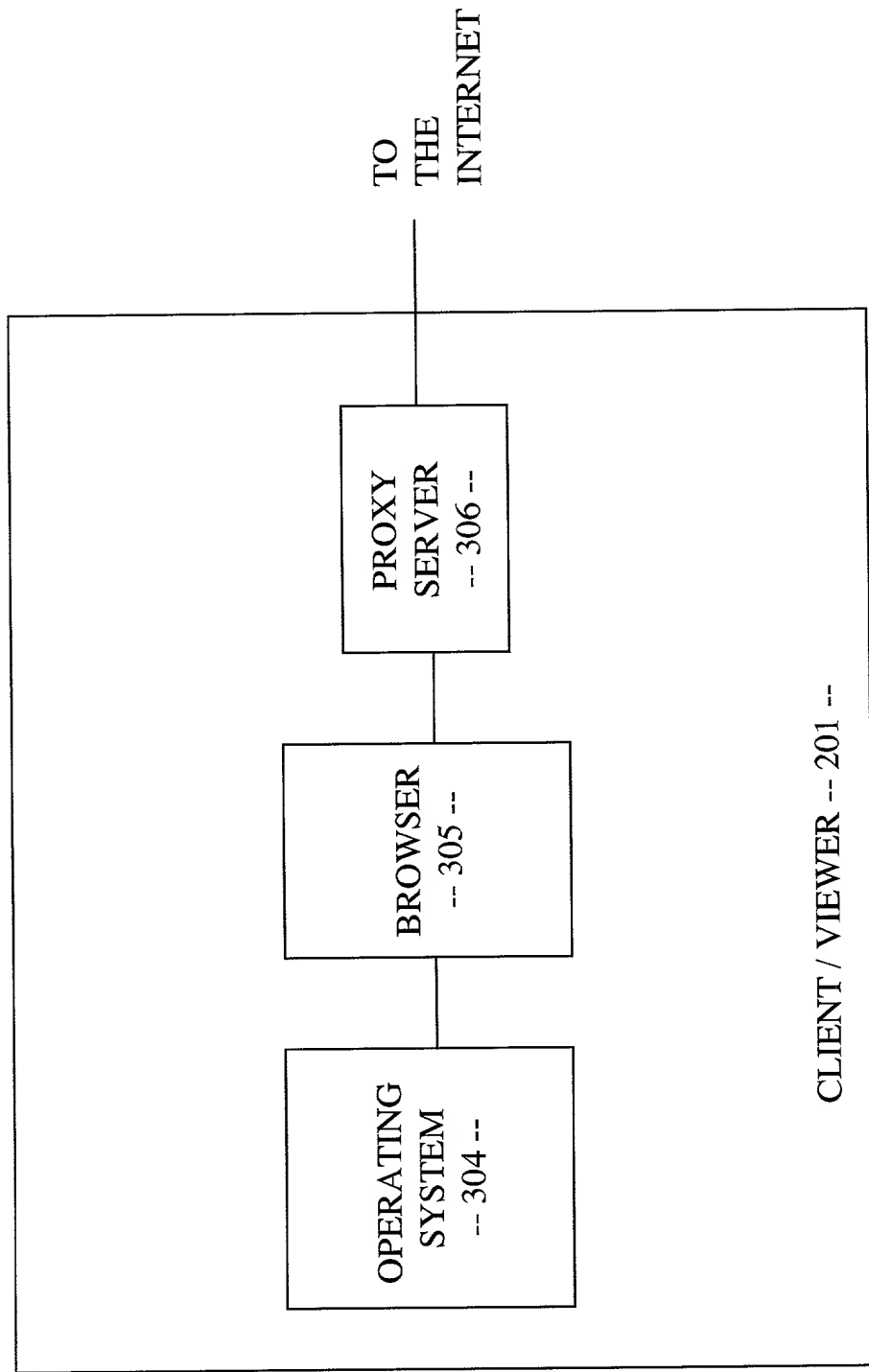


FIGURE 3B

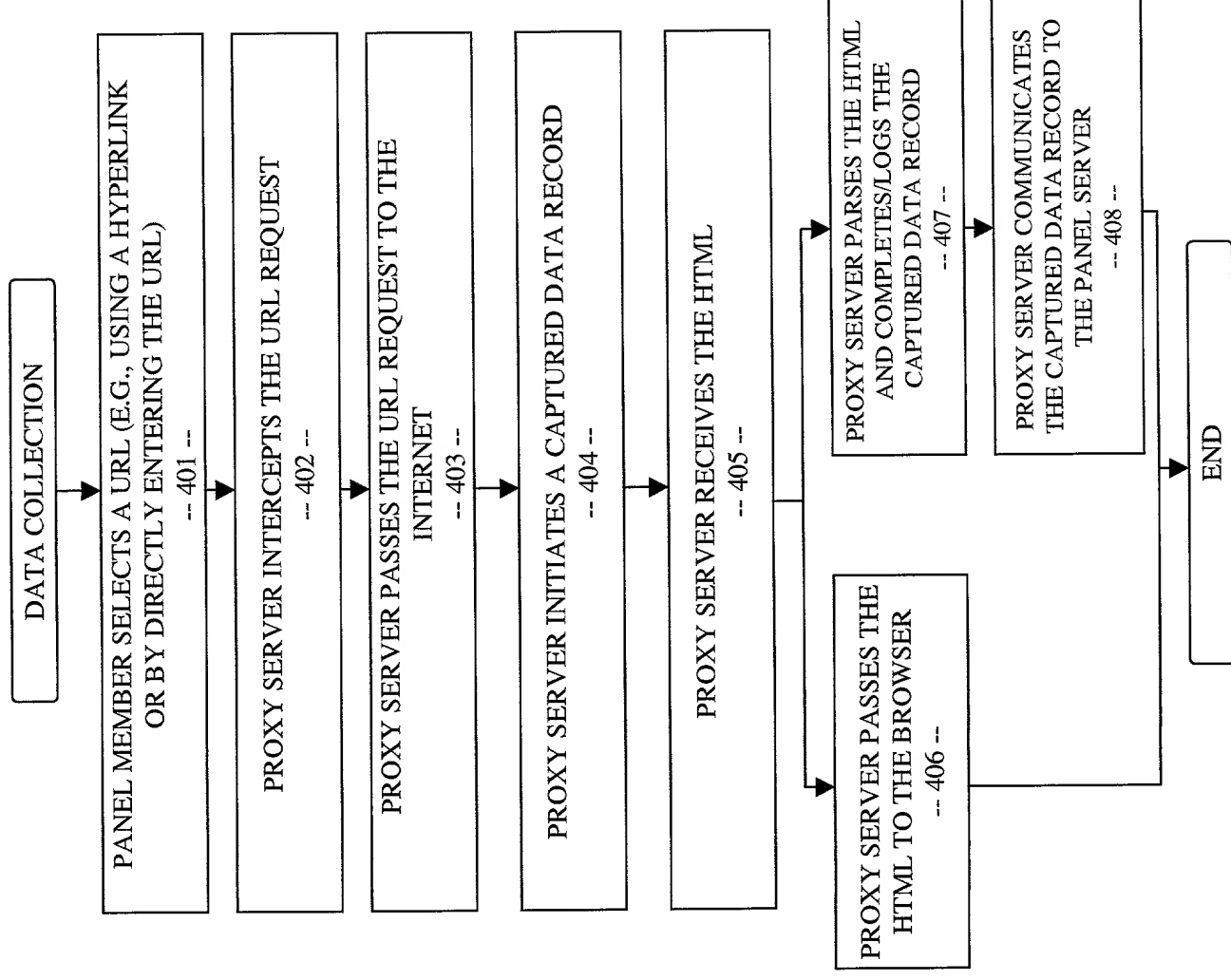


FIGURE 4

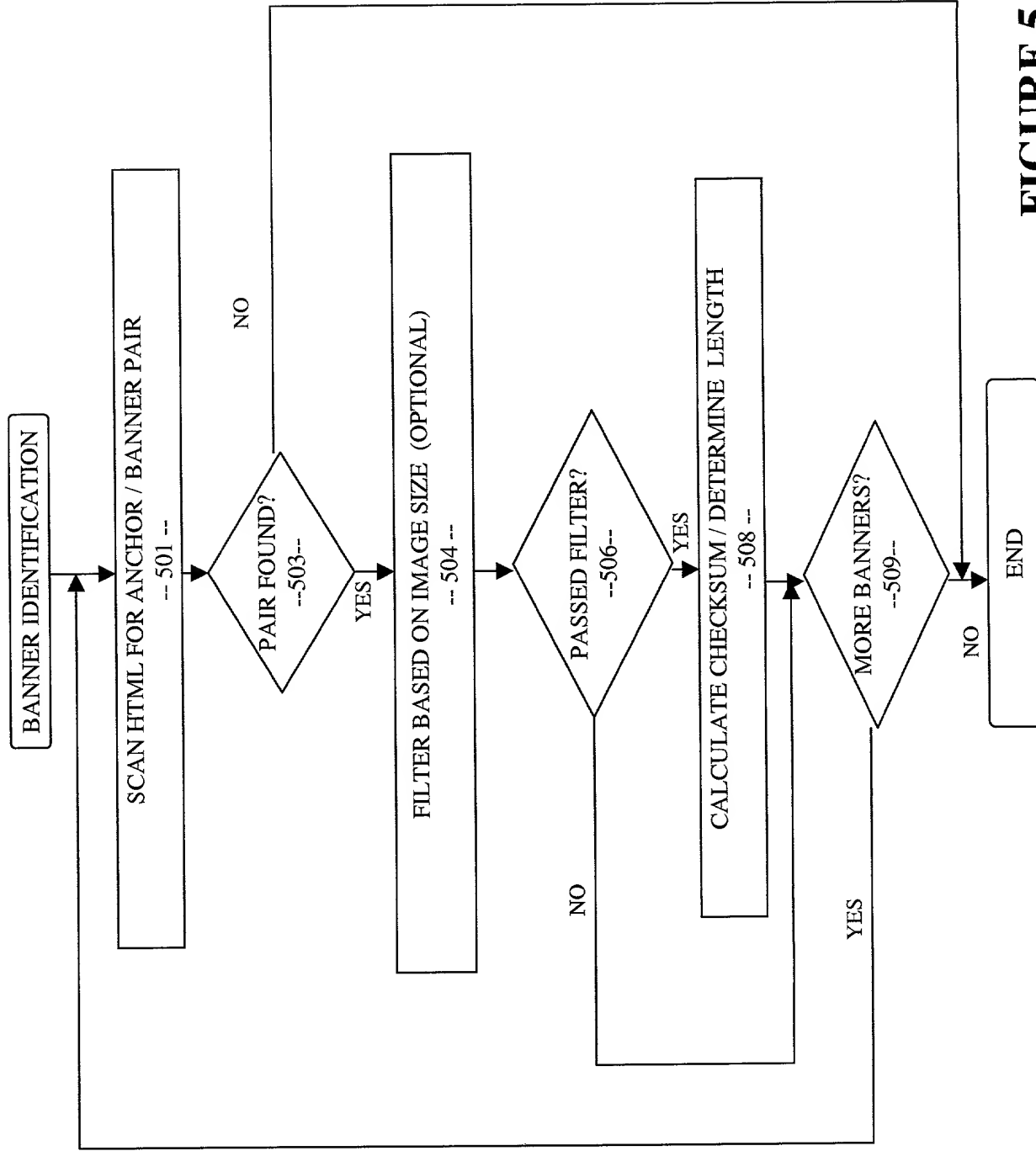


FIGURE 5

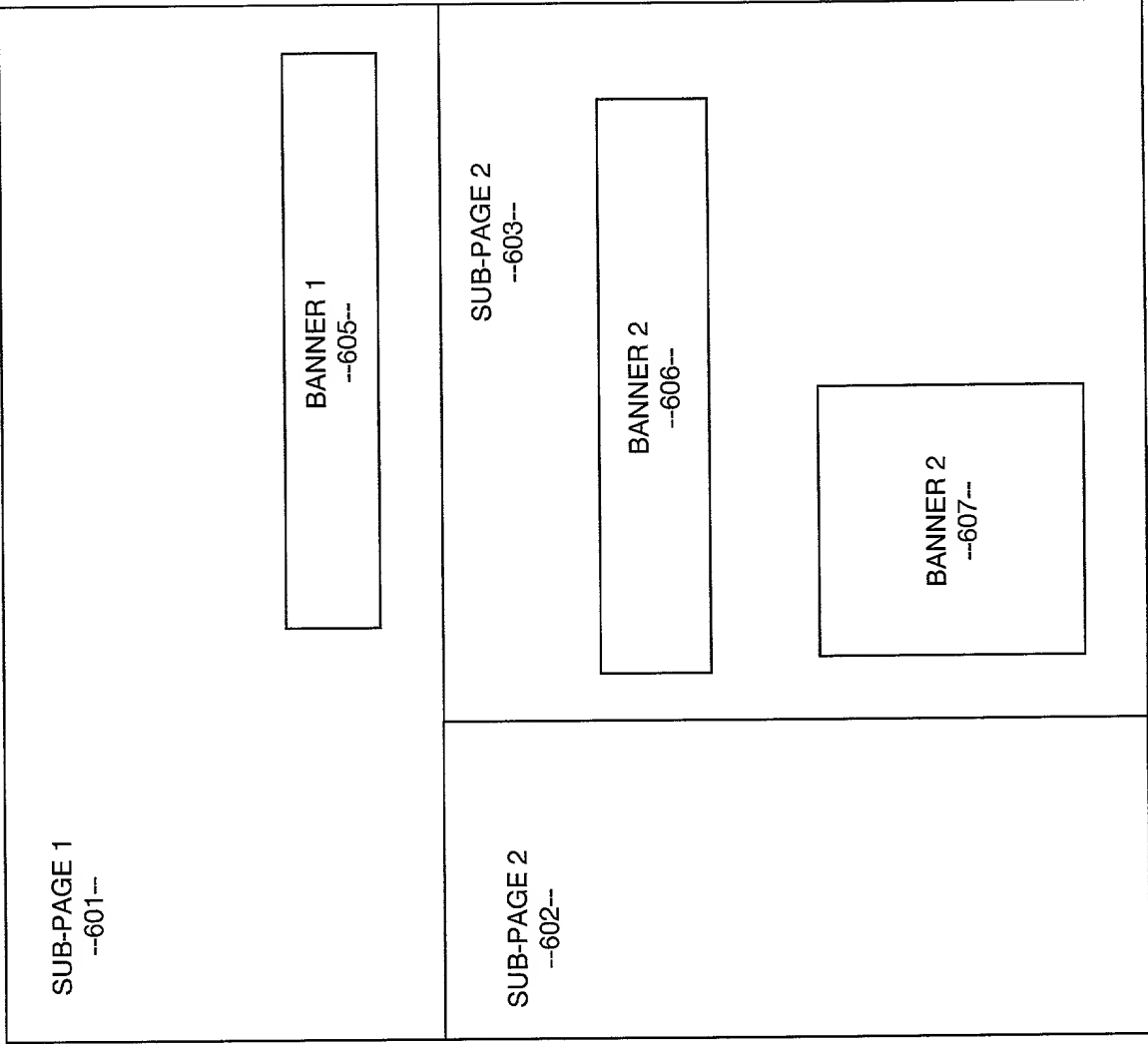


FIGURE 6

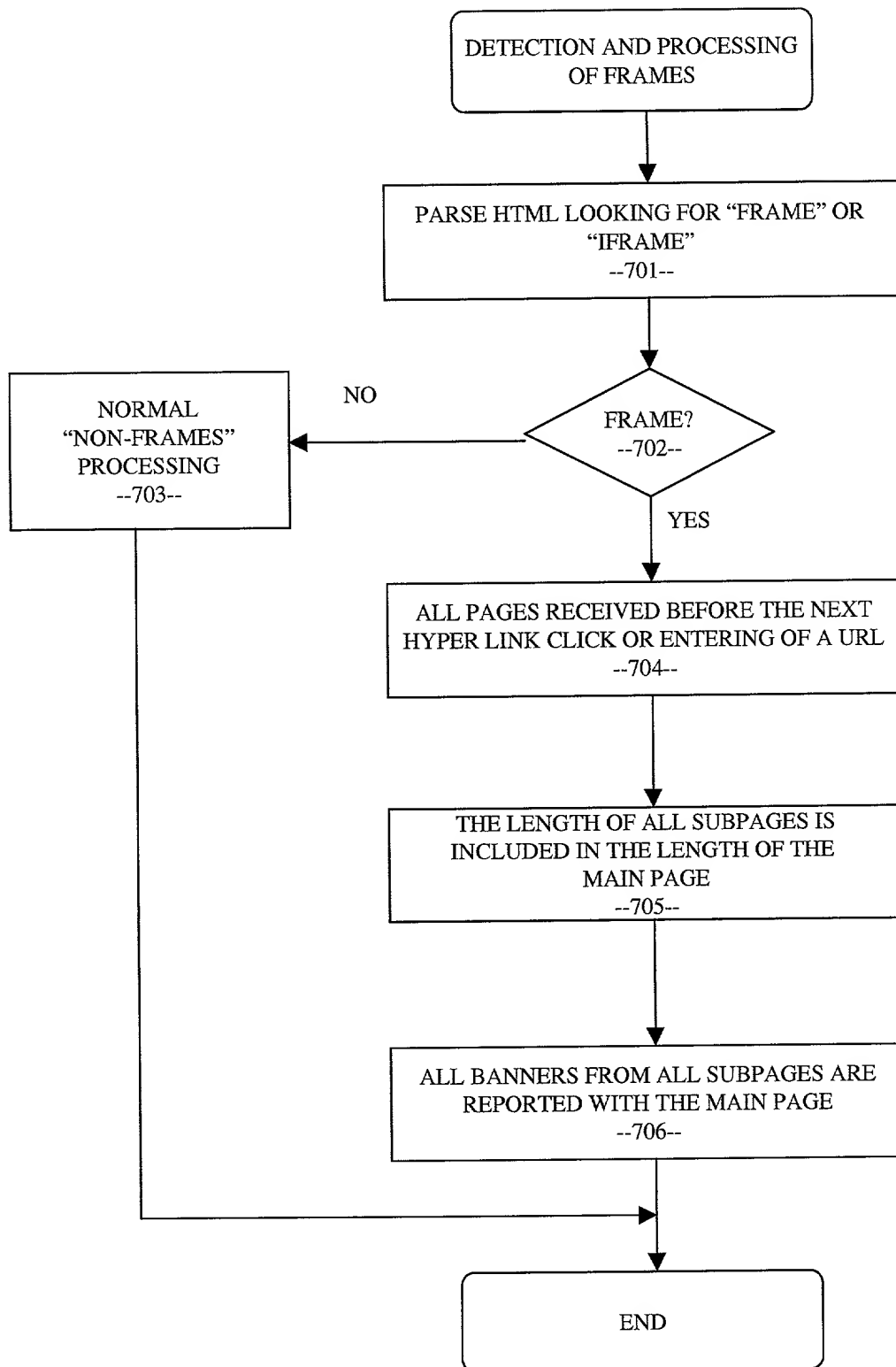


FIGURE 7

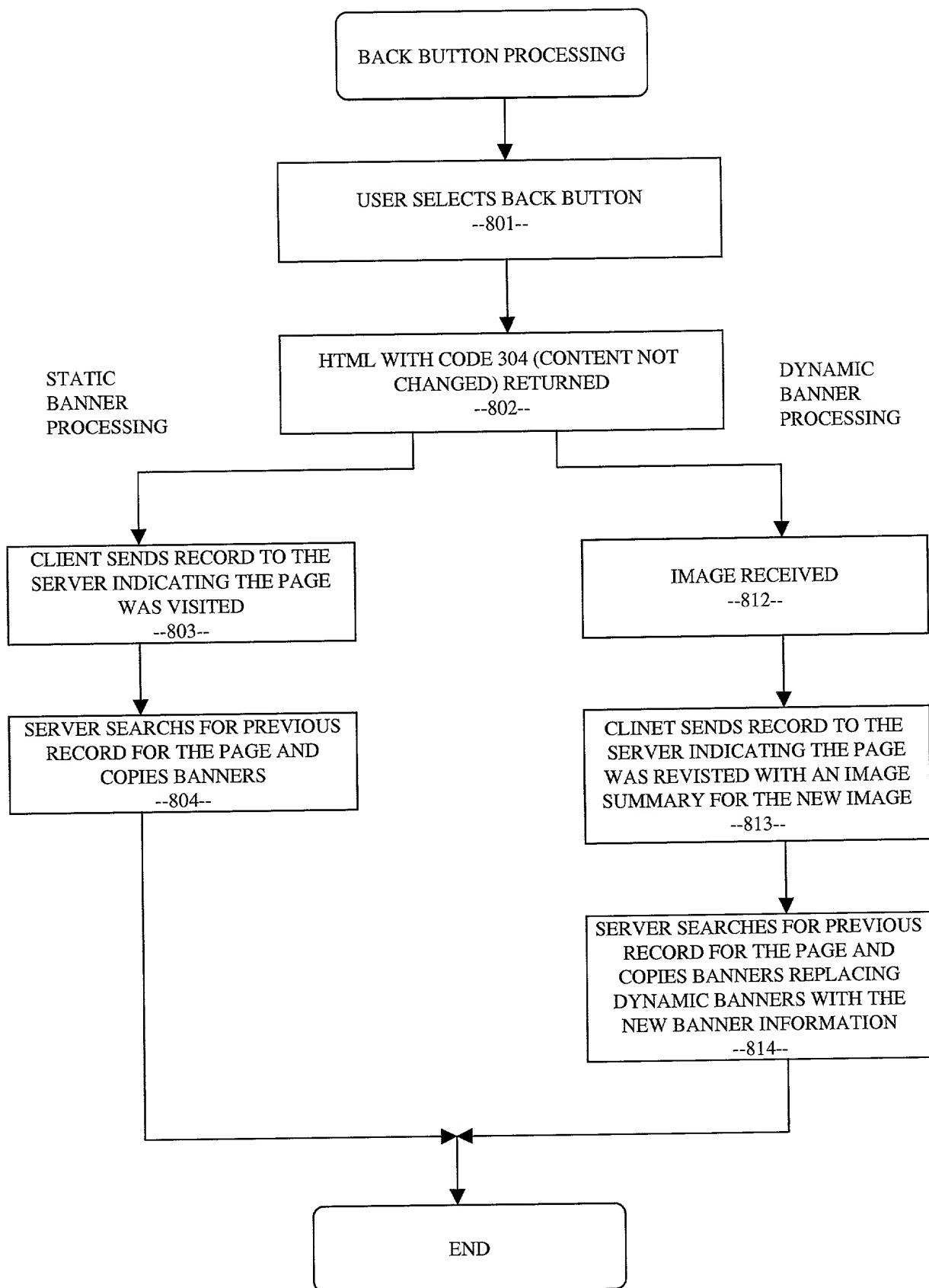


FIGURE 8

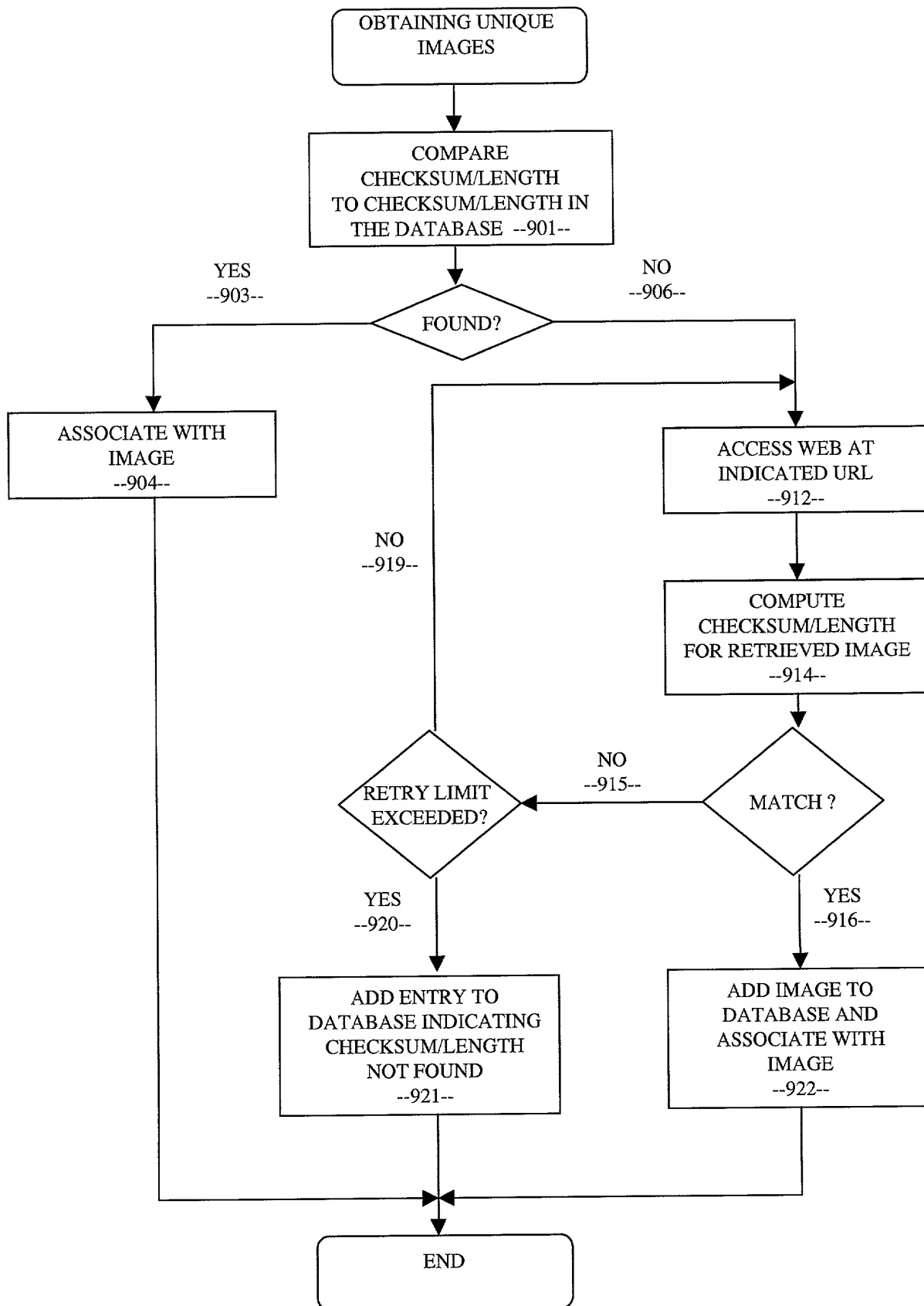


FIGURE 9

Docket No.

NRI-2001

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

METHOD AND APPARATUS FOR MEASURING USER ACCESS TO IMAGE DATA

the specification of which

(check one)

☒ is attached hereto.

☐ was filed on _____ as United States Application No. or PCT International Application Number _____ and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

(Number)

(Country)

(Day/Month/Year Filed)

☐

(Number)

(Country)

(Day/Month/Year Filed)

☐

(Number)

(Country)

(Day/Month/Year Filed)

☐

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

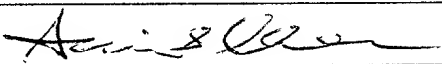
POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(list name and registration number)*

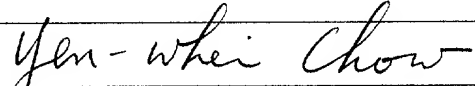
TERRY W. KRAMER Reg. No. 41,541

Send Correspondence to: TERRY W. KRAMER
KRAMER & ASSOCIATES
 2001 Jefferson Davis Hwy. Suite 808
 Arlington, VA 22202

Direct Telephone Calls to: *(name and telephone number)*

TERRY KRAMER (703) 413-3667

Full name of sole or first inventor Simon S. Chen	
Sole or first inventor's signature 	Date
Residence <u>1270 SAINT MARK CT, LOS ALTOS, CA 94024</u>	
Citizenship <u>USA</u>	
Post Office Address	

Full name of second inventor, if any Yen Whei Chow	
Second inventor's signature 	Date <u>3/10/99</u>
Residence <u>1128 Grimley Ln. San Jose, Ca. 95120</u>	
Citizenship <u>U.S.A.</u>	
Post Office Address	

Full name of third inventor, if any Todd Tao Zhou	
Third inventor's signature <i>Tao Zhou</i>	Date <i>3/10/99</i>
Residence <i>1759 Strawberry Ln.</i>	
Citizenship <i>China</i>	
Post Office Address	

Full name of fourth inventor, if any	
Fourth inventor's signature	Date
Residence	
Citizenship	
Post Office Address	

Full name of fifth inventor, if any	
Fifth inventor's signature	Date
Residence	
Citizenship	
Post Office Address	

Full name of sixth inventor, if any	
Sixth inventor's signature	Date
Residence	
Citizenship	
Post Office Address	